

BARG/HR filled products and release

Edward Baudrez Nicolas Clerboux Steven Dewitte
Alessandro Ipe Stijn Nevens Manon Urbain
Almudena Velázquez

Royal Meteorological Institute of Belgium

ERB Workshop Toulouse
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2. Comparisons with previous version (V003)

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Overview

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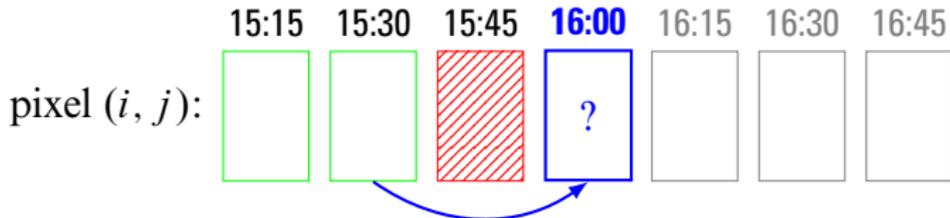
Appendices

- ▶ Scene ID extrapolation now happening in a window (forward and backward extrapolation in time)
- ▶ Providing flux in twilight region
- ▶ More pixels in monthly mean adjustment factor — more pixels in clear ocean sun glint filled
- ▶ Status flags and pixel algorithm images (HR and BARG)
- ▶ Fine tuning to BARG averaging

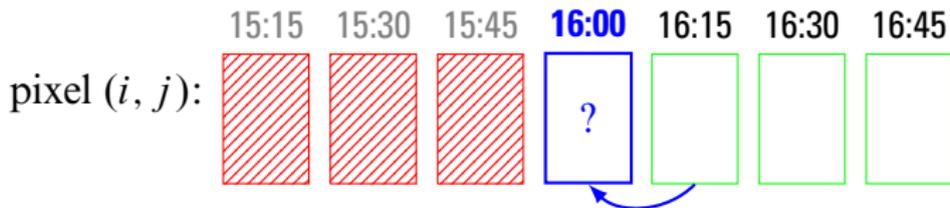
Scene ID extrapolation

- ▶ Sliding window centred on the current slot +/- 2.5 hours
- ▶ Forward and backward extrapolation in time

1. Backward scan (forward extrapolation in time)



2. Forward scan (backward extrapolation in time)



- ▶ (Configurable) limit $SZA < 80$
- ▶ Backward extrapolation very useful for morning slots

Twilight region flux

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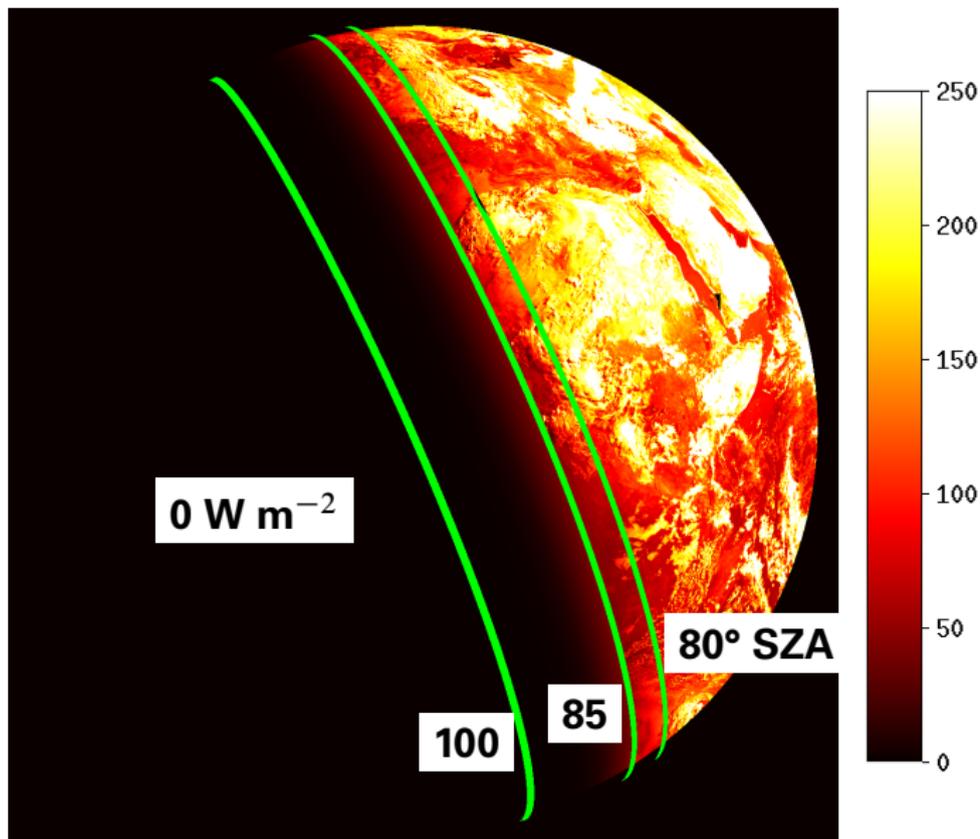
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Twilight region flux 80–85° SZA

- ▶ Between 80° SZA and 85, no flux was provided by GERB product
 - ▶ Solution: extrapolate scene ID and reperform radiance-to-flux conversion
- ▶ Some pixels before to 80° SZA are missing because clear-sky data are missing (up to 60 days prior to slot)
 - ▶ *Same solution*

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Twilight region flux 85–100° SZA

SZA, °	flux, W m ⁻²
84.5	48.3428
85.5	39.7990
86.5	31.7399
87.5	24.9577
88.5	18.4358
89.5	12.4553
90.5	7.5284
91.5	5.0543
92.5	2.9716
93.5	1.5336
94.5	0.9251
95.5	0.6051
96.5	0.3768
97.6	0.3004
98.5	0.2401
99.5	0.1802

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Adjustment factor clear ocean June 2004

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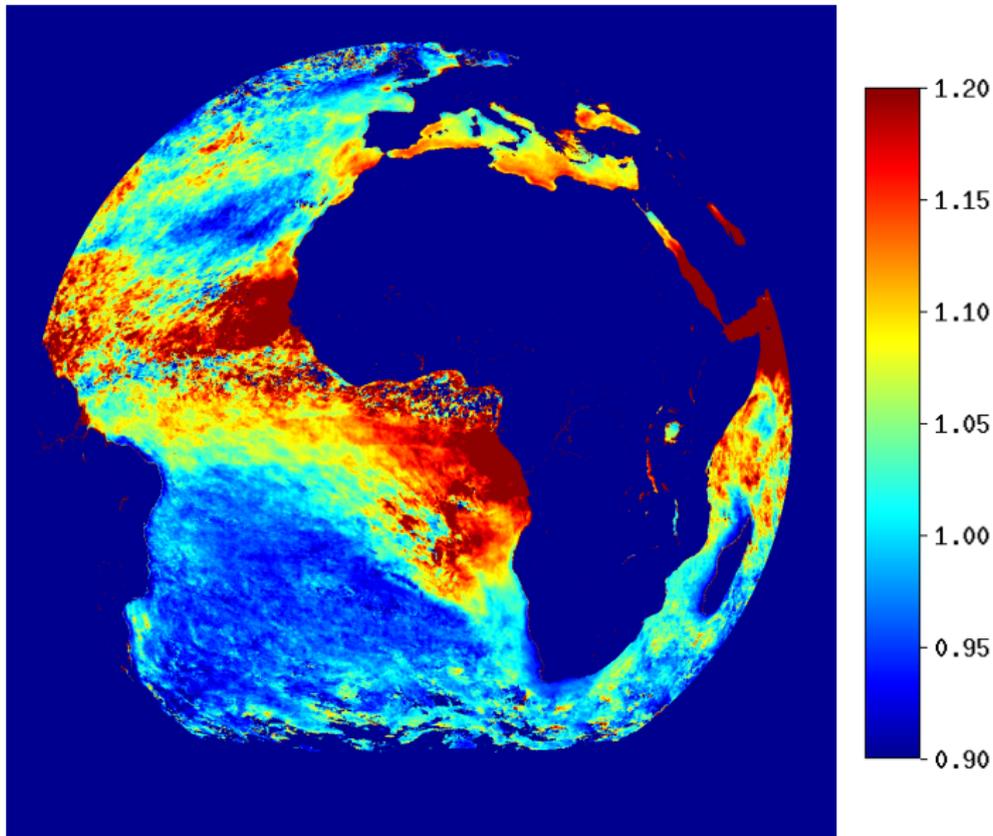
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Adjustment factor clear ocean Dec. 2004

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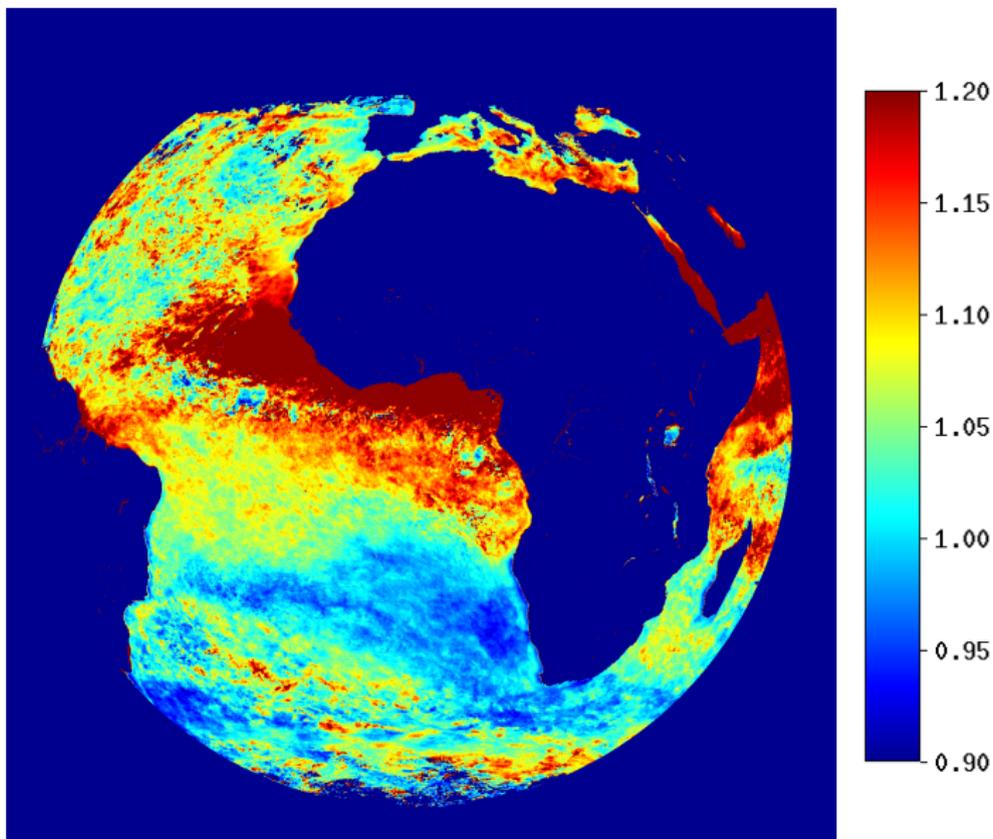
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Inclusion criteria adjustment factor

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- ▶ Need a monthly average clear-sky ocean ‘adjustment factor’ to convert TRMM model flux to GERB level
- ▶ Data for adjustment factor are collected in an off-line step
 - ▶ outside sun glint & twilight
 - ▶ clear-sky ocean
 - ▶ dust-free
 - ▶ surrounded by eight valid pixels

Inclusion criteria adjustment factor

- ▶ Need a monthly average clear-sky ocean ‘adjustment factor’ to convert TRMM model flux to GERB level
- ▶ Data for adjustment factor are collected in an off-line step
 - ▶ outside sun glint & twilight
 - ▶ clear-sky ocean
 - ▶ dust-free, **but allow ‘undefined’ dust flag**
 - ▶ surrounded by eight valid pixels, **but allow pixels next to coast**



Inclusion criteria adjustment factor

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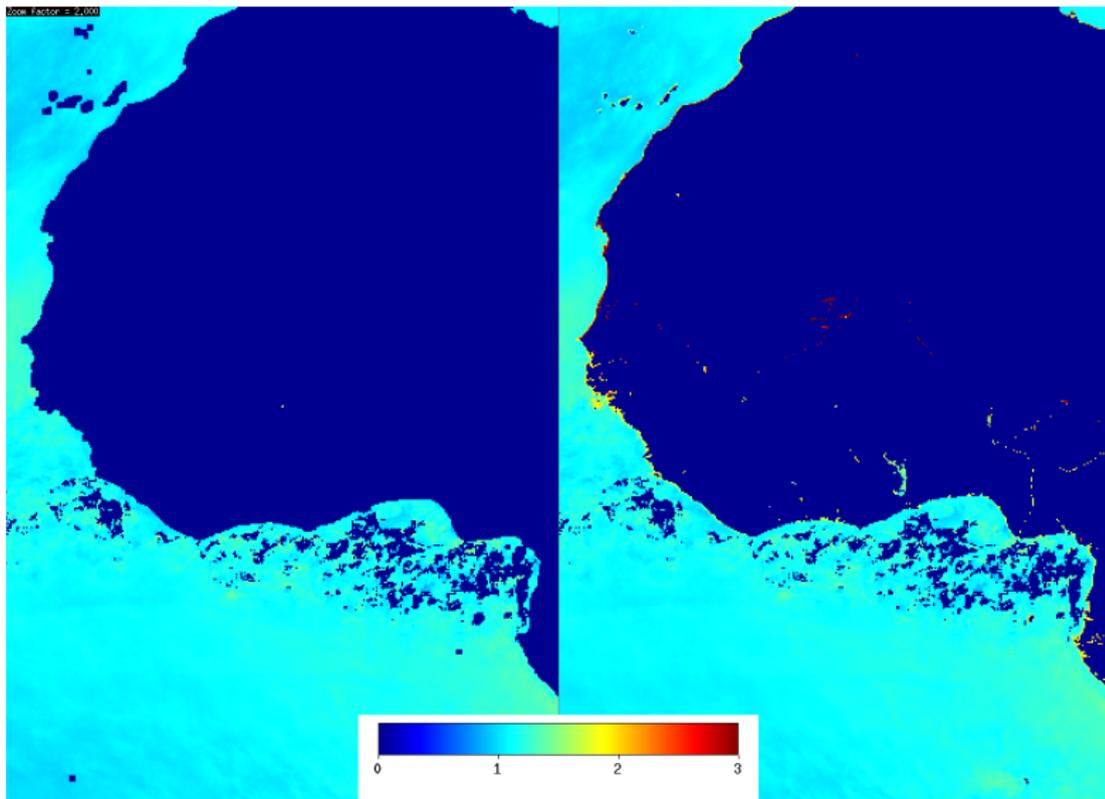
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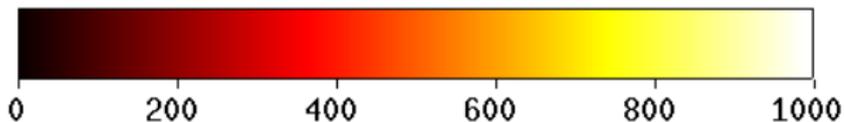
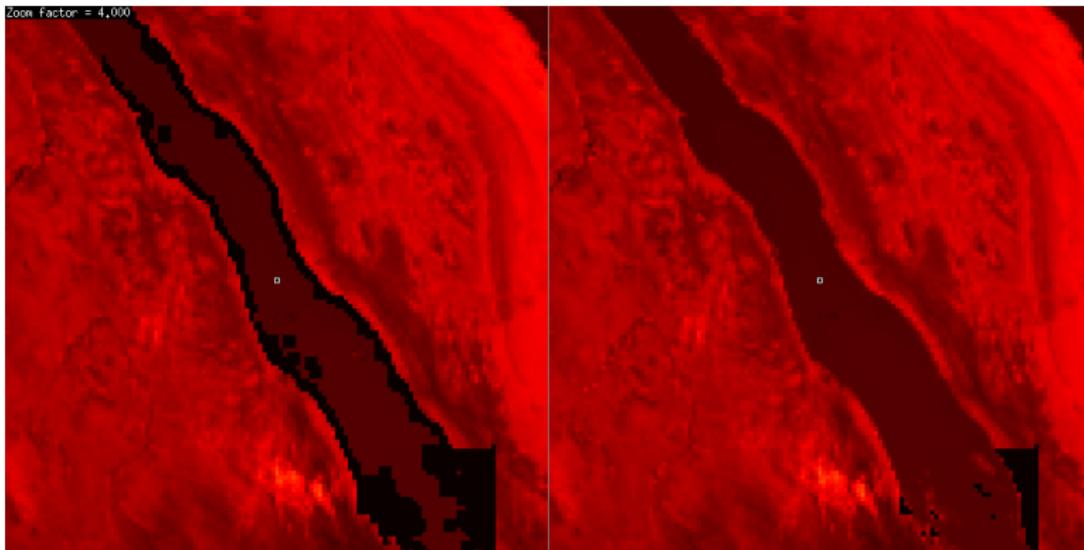
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Inclusion criteria adjustment factor

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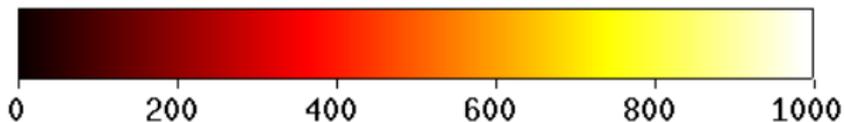
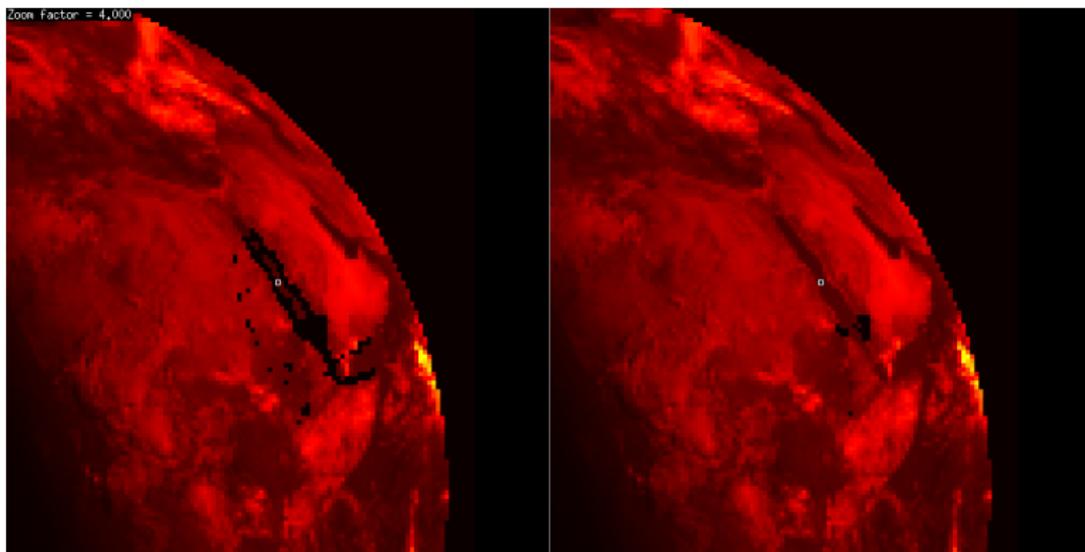
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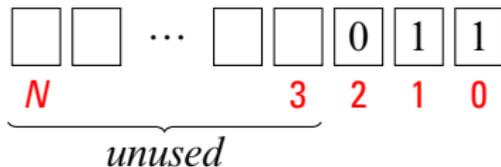
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- ▶ Status flag word: bit-packed status flag



- ▶ bit 2 : a twilight model has been applied to the flux
- ▶ bit 1 : an ocean model has been applied to the flux
- ▶ bit 0 : scene ID extrapolated
- ▶ For the moment only *algorithm* flags

Pixel algorithm field

- ▶ Pixel algorithm image indicates whether pixel was processed with 'old' algorithm (0) or sun glint/twilight algorithm (1)
- ▶ Shown for 1 June 2004, 05:15

HR



BARG



- ▶ Allows users to skip pixels whose scene ID or flux has been extrapolated or modelled

BARG spatial averaging

▶ GERB-like BARG

0	0	0
1	1	0
1	1	0



BARG

$$\frac{4}{9}$$

0	0	-1
1	1	0
1	1	0



BARG

$$\frac{1}{2}$$

▶ GERB BARG

0	0	0
1	1	0
1	1	0



BARG

$$\frac{4}{9}$$

0	0	-1
1	1	0
1	1	0



BARG

$$-1$$

- ▶ Try to minimize differences with previous version (V003) and between GERB and GERB-like
- ▶ In BARG, $\log(\text{Cloud Optical Depth})$ only shows cloud pixels with $\log(\text{COD}) > 0$

Status flags in BARG

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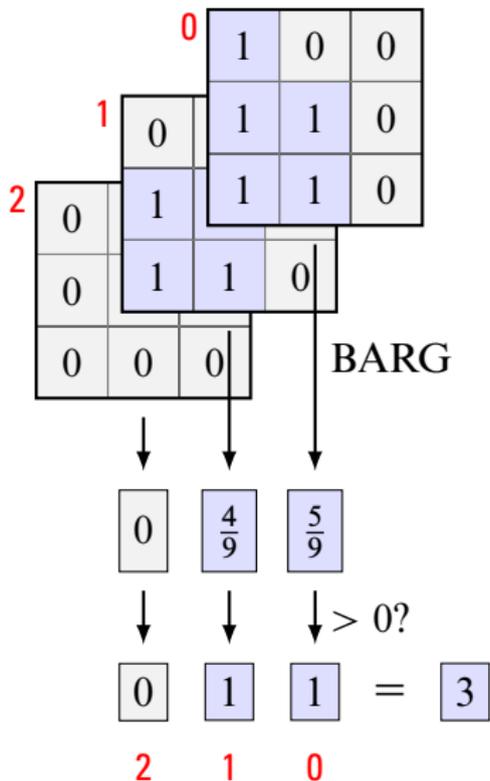
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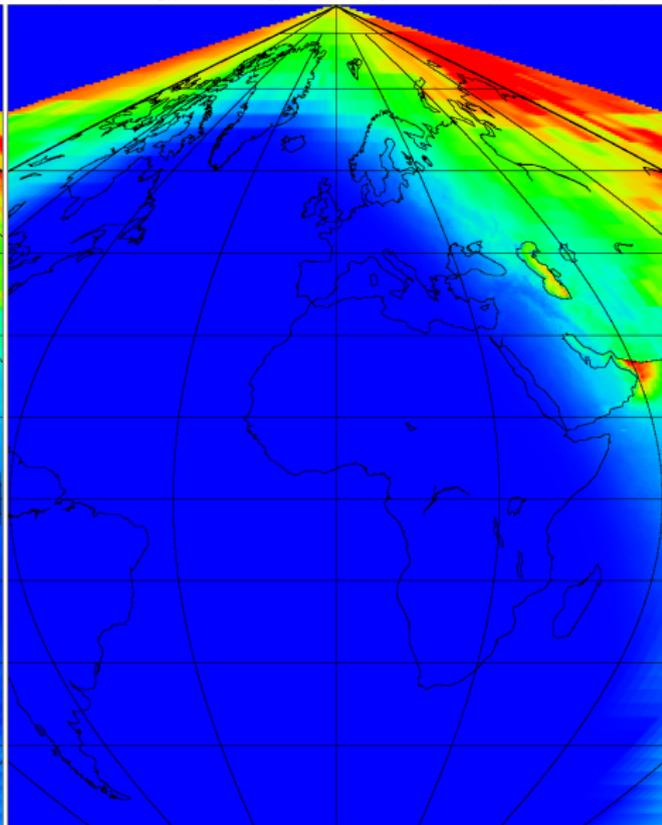
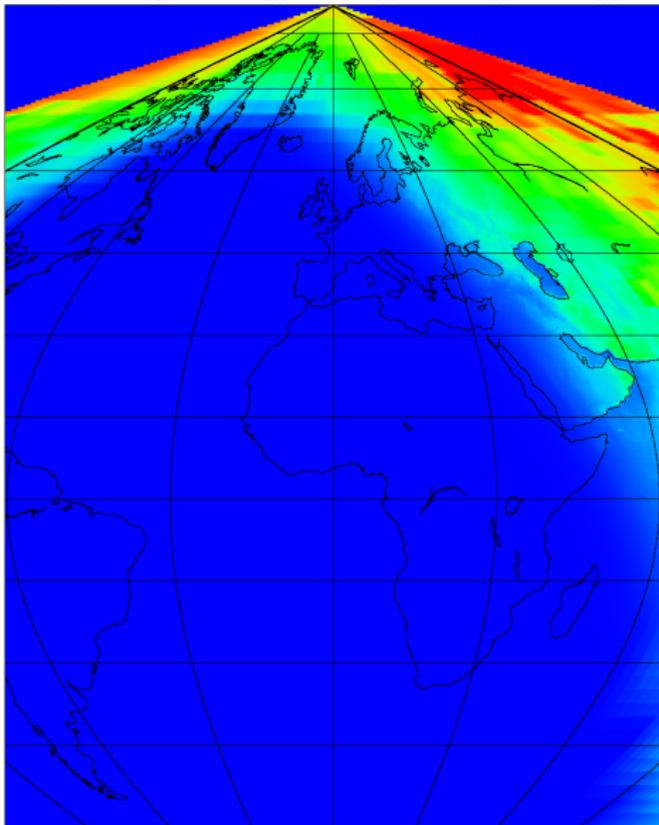
2. Comparisons with previous version (V003)

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NEW TOA Refl. Solar (TRS) [W/m^2]



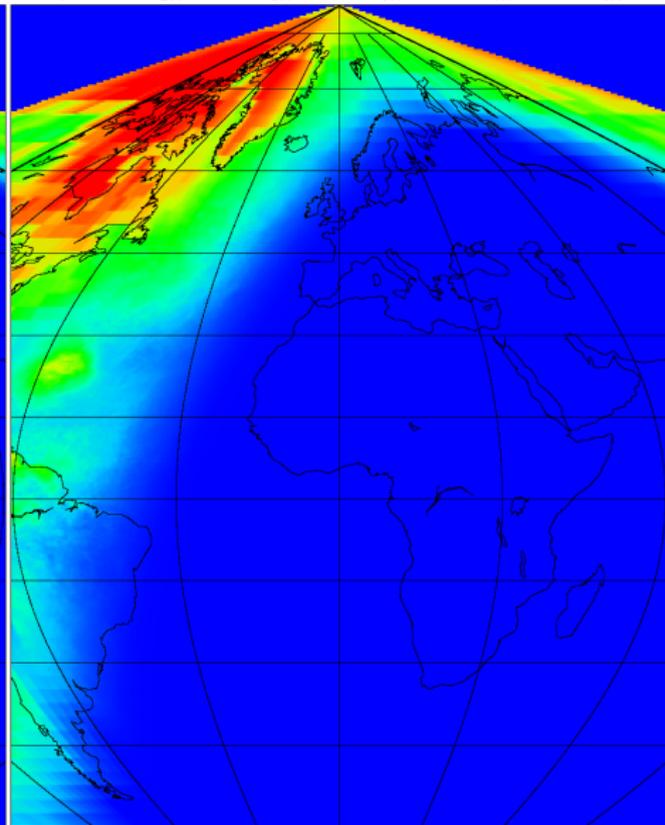
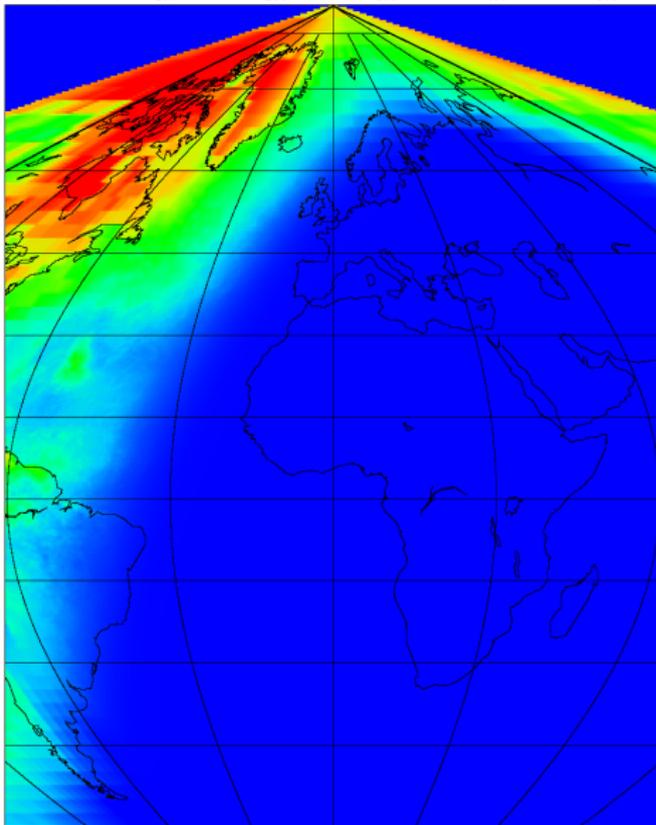
OLD TOA Refl. Solar (TRS) [W/m^2]



NEW TOA Refl. Solar (TRS) [W/m²]



OLD TOA Refl. Solar (TRS) [W/m²]

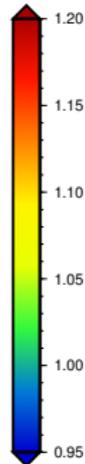
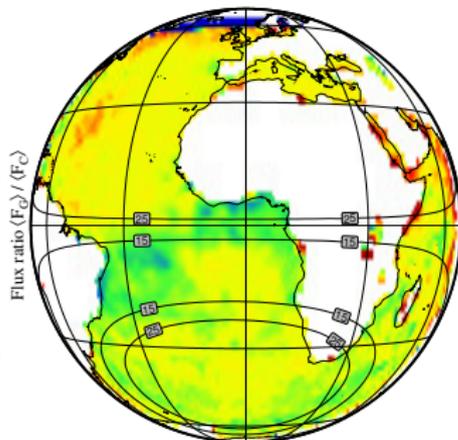
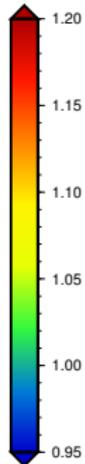
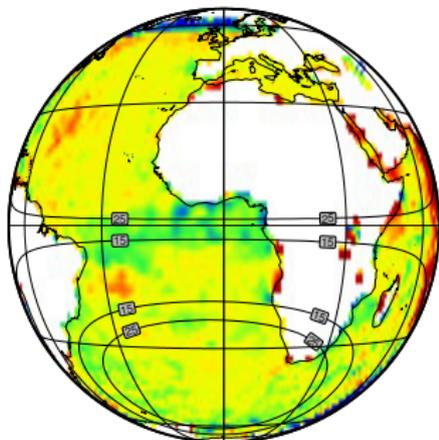
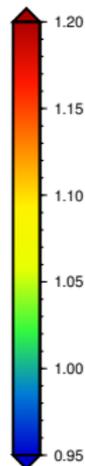
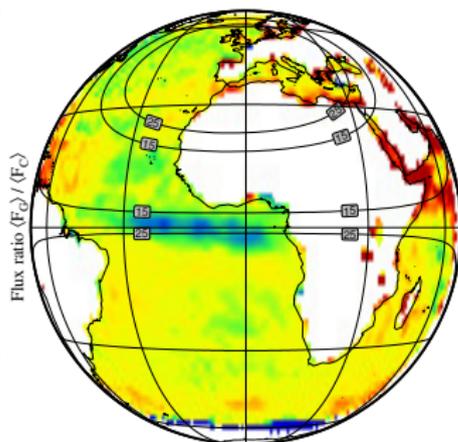
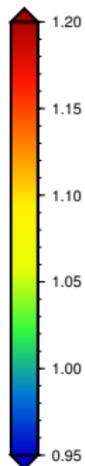
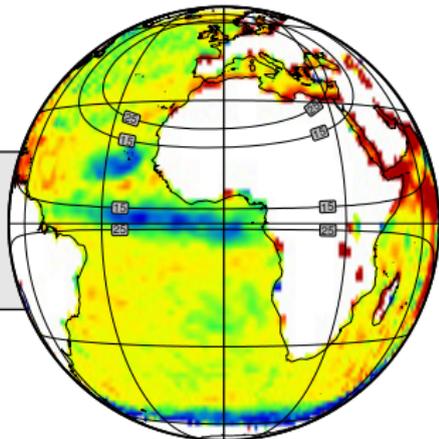


allsky

old | new

top: Jun 2004

bot: Dec 2004

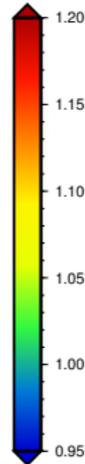
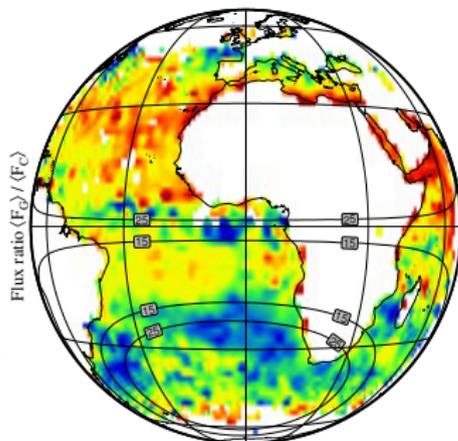
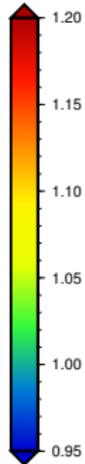
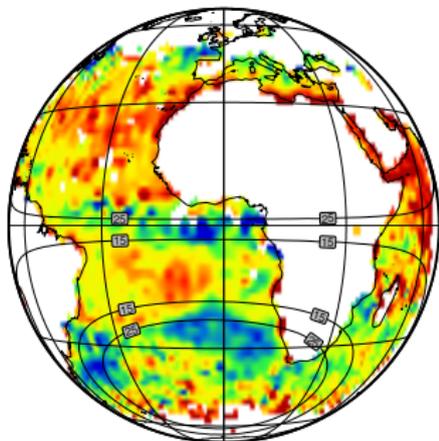
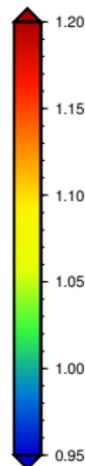
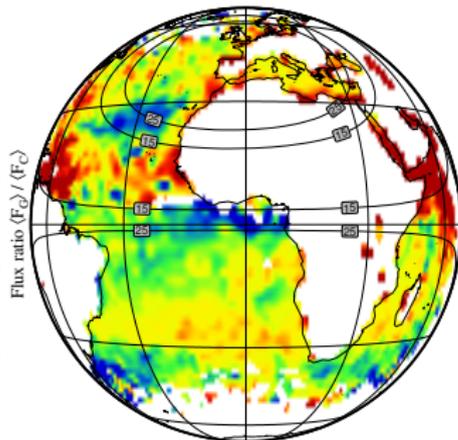
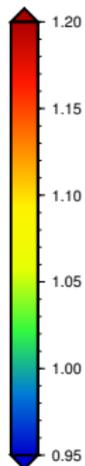
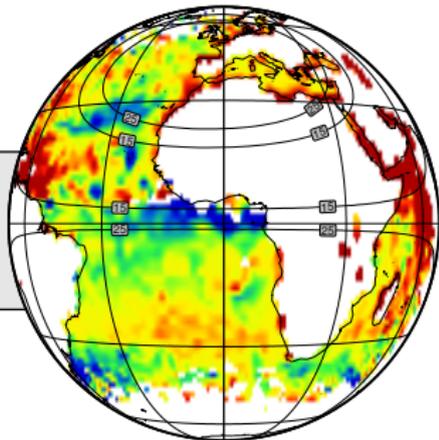


clearsky

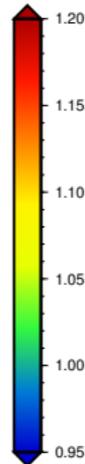
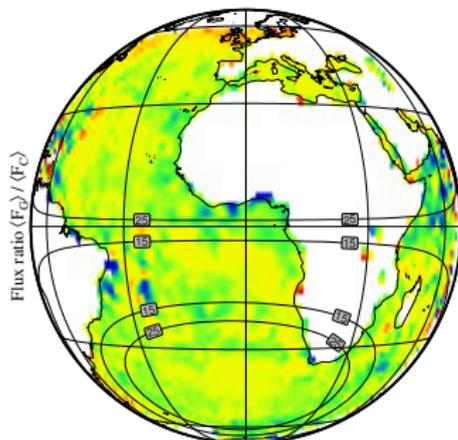
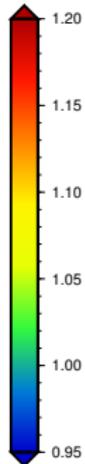
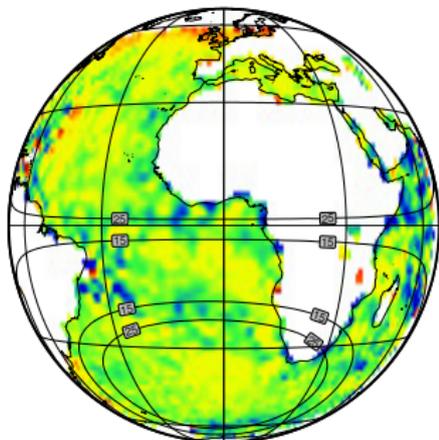
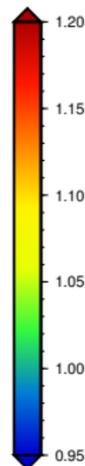
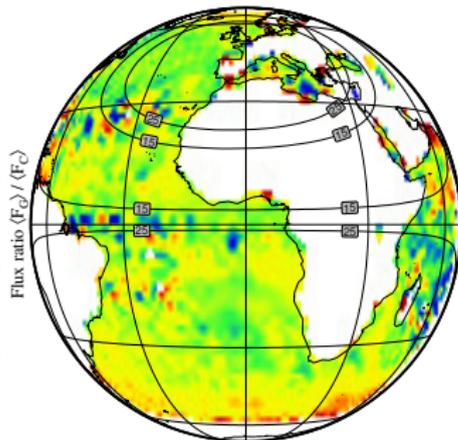
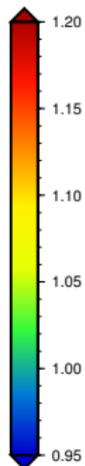
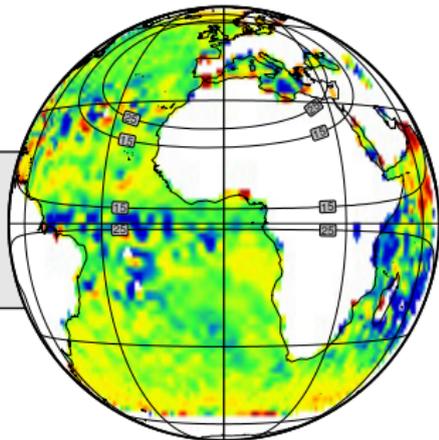
old | new

top: Jun 2004

bot: Dec 2004



overcast
old | new
top: Jun 2004
bot: Dec 2004





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- ▶ 2004 and 2005 processed (G2)
- ▶ Currently processing 2006 (G2)
- ▶ When complete and approved, will be provided at
 - ▶ RMIB: <http://gerb.oma.be>
 - ▶ BADC: <http://badc.nerc.ac.uk/gerb> (coming soon)



File format

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- ▶ Like previous V003, with existing fields updated where necessary
 - ▶ Added /RMIB/Pixel Algorithm
 - ▶ Added /RMIB/Status Flag Word 1
 - ▶ Added /RMIB/Git Commit Identifier
- ▶ HDF files produced with HDF v1.6
- ▶ GERB and GERB-like, BARG and HR
- ▶ Using internal GZIP compression (no longer using external GZIP compression)



What remains to be done

- ▶ Process all of 2006–2007 (G2)
- ▶ Process all of 2007–2013 (G1)
- ▶ Process all of 2013–2014 (GL)
- ▶ Remove files corresponding to known bad Level 1.5 files (will be done in a postprocessing step)

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Acknowledgements

- ▶ Dr. Jacqueline E. Russell, Imperial College
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- ▶ RMIB

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